

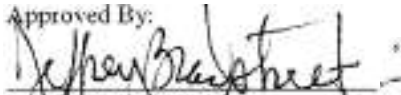
AI. GENERIC QUALITY ASSURANCE PROJECT PLAN
FOR
WORLD TRADE CENTER (WTC) RESIDUE SAMPLING
NEW YORK CITY, NEW YORK

U.S. EPA Work Assignment No.: 0-089
Lockheed Martin Work Order No.: EAC00089
U.S. EPA Contract No.: EP-C-04-032

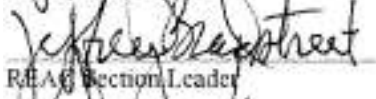
Prepared For:
United States Environmental Protection Agency/Environmental Response Team
Edison, NJ

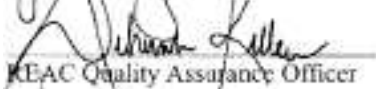
March 2005

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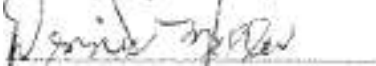

REAC Task Leader

Date


REAC Section Leader


REAC Quality Assurance Officer

Date


Denise M. Bostwick

Date

JRJBAC Program Manager U.S. EPA

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Work AssignroeatJ14a»sgc

0089-DQAPP-031805

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A. PROJECT MANAGEMENT

This project generic Quality Assurance Project Plan (QAPP) was prepared in accordance with *EPA Requirements for Quality Assurance Project Plans (QAPPs)*, EPA QA/R-5 and the *Response Engineering and Analytical Contract (REAC) Program QAPP*,

A3. DISTRIBUTION LIST

The following personnel will receive copies of the approved QAPP for the World Trade Center (WTC) Residue Sampling , Work Assignment (WA) No. 0-089.

1. Rajeshmal Singhvi, Environmental Protection Agency/Environmental Response Team (EPA/ERT) Work Assignment Manager (WAM)
2. Jacky Rosati, EPA, Research Triangle Park. North Carolina (NC)
3. Eletha Brady-Roberts, National Homeland Security Research Center (NHSRC)
4. Jeffrey Bradstreet, REAC Air Response Section Leader/Task Leader (TL)/Quality Control (QC) Coordinator
5. Deborah Killeen, REAC Quality Assurance Officer (QAO)
6. Dennis Miller, REAC Program Manager

A4. PROJECT ORGANIZATION

The following individuals will participate in the project:

EPA/ERT

Rajeshmal Singhvi -WAM
Jacky Rosati - Project Coordinator
Jeff Catanzarita - Technical Auditor
Eletha Brady-Roberts - NHRSC Quality Assurance (QA)

REAC

Jeffrey Bradstreet -TL/QC Coordinator
Miguel Trespalacios - Senior Air Sampling Scientist
Michael Hoppe - Environmental Scientist/Sampler
TBD - Environmental Scientists/Samplers
Richard Magan - Technician/Sampler
Deborah Killeen - QAO

Laboratories that will receive residue samples for chemical marker/signature identification on this project include:

Department of Environmental Sciences and Engineering, University of North Carolina,
United States Geological Survey (USGS) Denver Microbeam Laboratory, and Other
commercial laboratories to be determined.

The REAC TL/QC Coordinator for the project is the primary point of contact with the EPA/ERT WAM.. The XL is responsible for the completion of the Work Plan (WP) and QAPP, project team organization, and supervision of all project tasks, including reporting and deliverables. The EPA NHSRC will provide oversight and guidance in the field through the WAM.

A5, PROBLEM: DEFINITION

The World Trade Center (WTC) attacks on 11 September 2001 caused the airborne release of two types of dusts: those

related to the building collapse and fine particulate matter from the subsequent fires. There are concerns among residents of New York City (NYC) about the potential health effects of WTC dusts that might remain in buildings in NYC. The goal of this study is to collect dust samples from areas near the WTC and distant from the WTC (background NYC dusts). These dust samples will be used to validate chemical markers or signatures for WTC dust - as compared to background dust - for a larger sampling effort to identify indoor areas still contaminated with WTC dust. The markers or signatures for WTC dust are being developed by laboratories at EPA, USGS, and several universities. By sampling a number of contaminated and uncontaminated sites and by utilizing recently collected samples, the WTC signatures can be validated or improved for the larger sampling study to delineate contaminated areas.

The residue from the collapse of the WTC Towers may contain heavy metals (primarily lead, arsenic, and mercury), polynuclear aromatic hydrocarbons (PAHs), and other contaminants that EPA designated laboratories are investigating to associate specific analytes with the WTC.

A6. PROJECT DESCRIPTION AND SCHEDULE

The purpose of this project is to collect dust samples from designated buildings that may be from the collapse of the WTC towers or from background sites for comparison. EPA will identify contaminated and uncontaminated buildings in NYC and obtain access for REAC personnel to conduct sampling. To the extent possible, contaminated buildings that are within both the dust and the fire plumes will be selected, so that current dust samples for these two types of emissions can be collected. EPA may identify several groups of buildings over time, as permission for access is obtained. EPA will provide REAC personnel with the street address and the name and phone number for a contact person in each building identified for surveying.

This activity will involve conducting scoping surveys of buildings identified by the EPA in the NYC Area, preparing sampling plans, collecting samples, splitting samples for multiple laboratories, shipping samples, and archiving samples for up to two years for future analysis and report preparation.

The schedule of activities and reports is as follows:

WP	6 October 2004
Draft Generic QAPP	6 October 2004
Final Generic QAPP	18 March 2005
Draft Building Survey Form	15 October 2004
• Collect Residue Samples	As scheduled by EPA
• Prepare and Send Sample Aliquots	4 Days after sampling
• final Report	10 Days after sampling

A7. DATA QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT OF DATA

The focus of this project is to collect dust samples that may be contaminated with materials from the destruction of the WTC towers or are potentially uncontaminated. This QAPP covers the collection, storage and shipment of the samples to EPA designated laboratories. The specific chemical markers or signatures associated with WTC dust samples are investigatory and will be used to further define the project. Once defined, the specific chemical markers or signatures will be used to further define the project.

A8. TRAINING AND CERTIFICATION

The training of all field personnel involved with sampling activities is intrinsic to their position and required responsibilities. They will have the following documented training:

- Occupational Safety and Health Administration (OSHA) 40-hour and 8-hour refresher in Hazardous Waste Operations (20 CFR1910.120)

- Department of Transportation (DOT) hazardous materials shipping
- First Aid and Cardiopulmonary Resuscitation (CPR) training

A9. DOCUMENTS AND RECORDS

The RE AC Program QAPP serves as the basis for this generic QAPP. The most current approved version is available to all REAC technical personnel as an uncontrolled copy on the REAC Local Area Network (LAN). Documents and records that will be generated during this project include:

- WP
Draft Generic QAPP
- Final Generic QAPP
- Field logbooks
- Site maps
- Photos of Sampling Locations
- Chain of Custody forms
- Final Reports

The Final Report will provide a description of the project, field procedures, sample preparation procedures, difficulties encountered and will include validated final copies of chain of custody forms. All documentation will be recorded in accordance with REAC standard operating procedure (SOP) #2002, *Sample Documentation* and REAC SOP #4001, *Logbook Documentation*. The final report will be prepared using REAC SOP #4021, *Preparation of Final Reports*.

B. DATA GENERATION AND ACQUISITION

B1. SAMPLING PLAN DESIGN

Judgmental sampling will be used to select sample locations that are most likely to represent WTC residue or background dust. This will be based on historical information, visual inspection and best professional judgment of the WAM and sampling team. This type of sampling is used to identify contaminants present in areas potentially having the highest concentration of contaminants. Additional samples may be collected when requested by the WAM and EPA NHSRC personnel.

During the sampling of EPA specified buildings, dust samples will be collected from each of the buildings up to 20 in accordance with the EPA approved generic QAPP. Sampling will likely be performed at two types of areas in each building: a high traffic area (to characterize tracked-in dust) and a lowtraffic area (to represent settled indoor dust). Two low traffic areas will be specified for a total of three areas that will be sampled. The desired high traffic area is to be an area near a main entrance, preferably carpeted. The desired low-traffic areas include areas infrequently cleaned, such as the top of elevator housing, under refrigerators, behind file cabinets, above ceiling tiles, on high shelves, or in other areas that show visible dust accumulation and are infrequently disturbed. Sampling will not be restricted to carpeted areas as the intent of the sampling is to obtain the desired residue. If vacuum sampling is not possible or preferred, sweep sampling will be used to collect the residue. Sampling will not be conducted in areas that would likely contain chemicals in dusts that would interfere with the analysis for the WTC markers. The following areas will be avoided in the sampling effort:

- Areas with significant cigarette or cigar smoke, incense, or burning candles
- Areas near major outdoor combustion sources (e.g., power plants)

Due to the inability to obtain triplicate samples (once an area is sampled, little residual remains), three samples will be collected in the same general area, for a total of nine samples from a building (i.e., three sample areas times three samples in each general area). The proximity of the samples in each general area will be determined as a result of visual inspection in the field and discussions with the WAM.

B2. SAMPLING METHODS

Vacuum sampling will be performed in accordance with modified REAC SOP #2040, *Collection of Indoor Dust Samples From Carpeted Surfaces for Chemical Analysis Using a Nilfisk GS-80 Vacuum Cleaner*. This method may afford collection of samples large enough for analysis of both purported organic and inorganic signatures. Although the method specifies the size and shape of the areas to be sampled and the mass to be collected, the sample collection procedure will vary to accommodate the site-specific conditions and ensure that an adequate sample is obtained. If it is not feasible to use the vacuum method of sampling, samples will be collected in bulk by sweeping the residue into a pan or sample bag in accordance with modified ERT/REAC SOP #2011 *Chip, Wipe and Sweep Sampling*. The sample handling and data collection requirements specified in modified REAC SOP #2040 will be followed.

The area to be sampled is not measured before sampling, but after the sample is collected. This is a modification of both REAC SOP #2040 and ERT/REAC #2011. REAC SOP #2040 is further modified in that samples will also be collected from non-carpeted surfaces, the amount of sample collected will be visibly checked and dust weight calculations will not be performed. Sweep sampling utilizes a dedicated, hand held sweeper brush to acquire the sample from an area. The area sampled is measured after sampling.

Sample Volume, Container, Preservation and Holding Time. The collected samples are placed into appropriately sized glass jars or zip-lock plastic bags. Storage of the samples collected by sweep or vacuum are maintained in a refrigerated unit at 4 ± 2 degrees Celsius ($^{\circ}\text{C}$) after sieving.

Sampling Equipment Decontamination. The nozzles, wands and hoses are decontaminated after use with a bottle brush, to remove any accumulated dust in the hose and nozzle. When the nozzle is clean, it is removed and sprayed with reagent grade methanol and allowed to air dry on a clean surface. The wand and hose are then cleaned with the bottle brush. To continue a new polyliner and collection bag for the collection of another sample is installed.

B3. SAMPLE HANDLING AND CUSTODY

In the field, sampling data are recorded on a Vacuum Sampling Work Sheet or in a dedicated project logbook. Chain of custody (COC) records will be used to document the collection of dust samples by vacuum or bulk. All COC records will receive a peer review in the field prior to shipment of the samples in accordance with REAC SOP #4005, *Chain of Custody Procedures*.

All samples will be delivered to the REAC facility and sieved in accordance with modified REAC SOP 2040, *Collection of Indoor Dust Samples From Carpeted Surfaces for Chemical Analysis Using a Nilfisk GS-80 Vacuum Cleaner* and modified ERT/REAC SOP #2011 *Chip, Wipe and Sweep Sampling*. The samples will be sieved through a No. 100 sieve (150 microns [fim]). After sieving, the samples will either be transferred to jars, which will be placed into ZiplockTM storage bags, or directly into ZiplockTM storage bags, and then placed into a holding refrigerator with the corresponding COC record.

Scribe* spreadsheet formats will be used for sample management. REAC is required by contract to use Scribe" to track and log the samples. In addition a unique sample numbering system has been established to each sample, which identifies the site identification, event number and the sample number. Additional information is provided with the sample number to identify whether it is a sieved (S) or coarse (C) fraction and the weight of the fraction in grams, e.g., SO. 1.

The samples collected by REAC personnel will be shipped to the designated laboratory for analysis in accordance with REAC SOP #2004, *Sample Packaging and Shipment*. One of the four aliquots of each sample will be retained and stored by REAC staff for up to two years in a secure refrigerator,

B4. ANALYTICAL METHODS

Once specific chemical markers or signatures have been defined, EPA personnel in consultation with NHSRC will be

determine which analyses will be appropriate. The laboratories specified under Section A4 are conducting the investigatory work.

B 5. QUALITY CONTROL

This QAPP covers the collection, storage and shipment of the samples to EPA designated laboratories for analysis. Quality control for the field and storage procedures are as follows:

- Field documentation on Field Sampling Worksheets or in logbooks
Documentation of temperature for the dedicated secure refrigerator

Duplicate samples will not be taken due to the nature of the sampling method. Once an area is vacuumed, little residual sample remains. Quality control for the laboratory procedures will be specified by the EPA/NHSRC.

B6. INSTRUMENT/EQUIPMENT TESTING, INSPECTION AND MAINTENANCE

The Nilfisk vacuums used in the collection of the residue samples will be maintained in accordance with established specifications. On a quarterly basis, the parts of the Nilfisk vacuum cleaners are inspected for cracks and breaks. An inventory of available supplies is conducted every three months.

B7. INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

The instrument/equipment calibration frequency is not applicable to this QAPP.

B8. INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

REAC personnel are responsible for the procurement, inspection, and acceptance of supplies and consumables for this WA. The vacuum cleaner filters purchased by REAC personnel must meet the requirements specified by the manufacturer. The REAC TL and Group Leaders are responsible for ensuring that the correct filters and sampling bags are specified in the purchase orders and verifying upon receipt that the correct parts have been shipped. It is the responsibility of the EPAVERT to provide adequate facilities, equipment and supplies for REAC to perform all field related tasks for this WA.

B9. NON-DIRECT MEASUREMENTS This

section is not applicable to this QAPP. BIO.

DATA MANAGEMENT

The QAPP is identified by the footer located on the bottom left hand corner of the page. The file identification represents the structure and the filename. The filename starts with the 3-digit WA number preceded by a "zero", then the deliverable type (D or N) to identify the document as a deliverable or non-deliverable followed by the document type. For amended or revised documents, the letters "A" and "R" for amended and revised, respectively, and the appropriate amendment or revision number (e.g. 1,2,3....) are added after the document type. After the document type and revision/amendment code (if any), a six-digit code based on the month, day and year (mmddyy) is added to indicate the date the document was delivered to the client.

Field sampling data will initially be recorded on field data sheets and in field notebooks. Samples will be identified by the field assigned sample number. Paper versions of all deliverables (Work Plan, Generic QAPP and Final Reports) will be provided to the ERT WAM and stored in the REAC Central Files. Electronic versions of all deliverables will be saved on the REAC archive drive in accordance with Administrative Procedures (AP) #34, *Archiving Electronic Files*. All data deliverables for this WA will be posted to the ERT-Information Management System (IMS) web site as either a Scribe* electronic data deliverable (EDD) or in portable document format (.pdf). Submission of the deliverable to the

appropriate ERT-IMS website will be considered delivery to the WAM as of the date and time such deliverables are received on the website.

Field log books will also be archived once the project is completed and the Work Assignment 0-089 is closed. All SOPs referenced in this QAPP are available on the REAC LAN.

C. ASSESSMENT/OVERSIGHT

CI. ASSESSMENT AND RESPONSE ACTIONS

The REAC TL, Air Response Section Leader, QAO and QC Coordinator are responsible for QC assessments and corrective action for this WA. These personnel have the authority to issue stop work orders. The tasks associated with this QAPP are assessed through the use of peer reviews, technical reviews and/or technical system audits, and management system reviews. Peer review enables the reviewers to identify and correct reporting errors before reports are submitted. Technical reviews are conducted by those immediately responsible for overseeing or performing the work (self-assessments). An independent assessment or technical audit will be performed by Jeff Catanzarita. Management system reviews establish compliance with prevailing management structure, policies and procedures, and ensures that the required data are obtained.

Peer reviews are conducted on project deliverables to ensure a technical review with respect to content, completeness and the overall quality of the deliverable prior to submittal to the EPA/ERT. The responsibilities of the review team and the sequence in which the deliverable is reviewed, is outlined in REAC AP #22, *Peer Review of REAC Deliverable**. The REAC QAO will audit data deliverables on a biannual basis to determine compliance with the peer review procedures.

The EPA/ERT WAM for this task will be present and will have the responsibility for verifying that the proper SOPs and sampling procedures are followed. If any technical issues or deficiencies are identified, they will be reported to the REAC TL for immediate resolution or corrective action. Any changes in scope of work will be documented on a Field Change Form and approved by the WAM.

C2. REPORTS TO MANAGEMENT

Monthly technical reports will be prepared for this WA when hours have been charged on a monthly basis. These reports will detail the accomplishments for the past month, any problems encountered, solutions to rectify the problem, contacts and meetings, goals for the next month, and an estimate of the of the total labor hours and costs for the next reporting period. The monthly technical reports are submitted to the EPA/ERT Project Officer and WAM.

On a quarterly basis, the REAC QAO provides a report to the REAC Program manager and the ERT QA Manager that summarizes the quality assurance (QA) activities on a quarterly period. These reports include results of performance evaluation samples, system audits (internal and external), summary of non-conformance and corrective actions, preparation of SOPs for analytical and operational activities, training, contacts/meetings and other QA activities.

REAC Report	Recipients
Monthly Progress	EPA/ERT Project Officer and WAM
Quarterly QA Reports	EPA/ERT Project Officer and WAM

D. DATA VALIDATION AND USABILITY

D1. DATA REVIEW, VERIFICATION AND VALIDATION

For field activities, it is necessary to determine whether the samples were collected using the sampling design specified in element B1, whether the samples were collected according to a specific method or SOP as specified in element B2, and whether the collected samples have been recorded and handled properly as in element B3. Field sampling worksheets and field notes will be reviewed by the RE AC TL for completeness. The COC records will be reviewed to ensure that the field information has been accurately reflected on the COC records.

D2. VERIFICATION AND VALIDATION METHODS

Verification occurs at each level in the field to ensure that appropriate outputs are being generated routinely. Records produced electronically or maintained as hard copies are subject to data verification. During field activities, records associated with sample collection such as field data sheets, COC records, logbook documentation, or electronic devices to log samples are verified. Naming conventions for the initial samples and samples fractions produced during sieving are verified by the RE AC TL. Chain of custody records are verified along with refrigerator and freezer logs to ensure the integrity of the samples.

There is no analytical data being generated under this WA; therefore, procedures for verifying and validating data, including the chain of custody for data throughout the life cycle is not applicable.

D3. RECONCILIATION WITH USER REQUIREMENTS

Responsibility lies with the EPA, thus, this element is not applicable to this QAPP.

REFERENCES

Response Engineering and Analytical Contract. 2003. *Quality Assurance Project Plan for the Response, Engineering, and Analytical Contract*, Revision 0.0.

U.S. Environmental Protection Agency. 1990, *Quality Assurance/Quality Control Guidance for Removal Activities*, EPA/540/G-9/004, Office of Emergency and Remedial Response.

U.S. Environmental Protection Agency. 2001. *EPA Requirements for Quality Assurance Project Plans (QAPPs)*, EPA/240/B -01/003, Office of Environmental Information.

TABLE I Field Sampling Summary
World Trade Center (WTC) Residue Sampling
March 2005

Analytical Parameter	Sampling Method	Preservation	Total Samples	Maximum Number Samples
Dust/Settled Particulate	Nilfisk GS-80 Vacuum Cleaner	Up to 2 years at 4 degrees C +/-2 degrees C	Up to 9 per Building	9
Dust/Settled Particulate	Sweep	Up to 2 years at 4 degrees C +/-7. degrees C	Up to 9 per Building	9

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